valve ~~plug~~ 44 is turned in a counter-clockwise position, reference being made to Figure 9, the valve plug 44 will be displaced slightly so that it is moved slightly axially to the right [to the right], reference being made to Figures 6 and 8. However, inasmuch as the duct 42 is in alignment with the opening 49, water flow will be permitted in any event and a slight amount of water flowing around the end 47 will not create any malfunction of the valve arrangement.

The wall thickness of the pop-up shaft 34 is increased, such that the water passageway 42 is roughly 3/16 to 1/4 inch in diameter. This modification increases the amount of plastic in order to allow for installation of the valve stem. In essentially all embodiments, it will be necessary to increase wall thickness in order to accommodate the small control valve of the present invention. One portion of the sprinkler head body almost necessarily has to be thickened so as to allow for the use of a valve plug to control water flow. Clearly, the same holds true when the small end valve is located in a riser tube of modified design. Even in the case of an adaptive fitting, which may also be in the nature of a coupling, it is also necessary to provide a thickened wall section to allow receipt of a shiftable plunger for control of water flow (Figure 14 and 15).

In essence, the valve plug or valve stem 44 can easily adopt the form of a 1/4 to 5/16 inch diameter set screw. Th diameter of

the valve plug can vary. How v r, in one embodim nt, the valve plug has a 1/4 to 5/16 inch diameter. In another embodiment, the diameter ranges from are 3/8 and ½ inch. However, there is no criticality to these diameter ranges, except that the interior [surface] plug must be capable of having a hole drilled or otherwise formed therein. Moreover, [it must] the hole should have a diameter not less than that of the duct. When the valve stem 44 is torqued against the inner end of the recess, the opening will b rotated to close off the passageway. In pop-up heads, the outer end of the set screw or valve plug is flush with or recessed slightly below the outer surface of the pop-up riser shaft when in the opened or closed position. The inside end 47 of the valve plug 44 is rounded so as to fit snugly within the recess 46, when shown in the closed position, as shown in Figures 5 and 7. In this way, this type of construction precludes water leaking past the plug 44 or out from the sides of the valve arrangement. The recess 46 actually precludes water moving up the duct 42 when in the off position.

Figures 10 and [12] 11 illustrate the arrangement of the valve assembly of the present invention incorporated in the body of a stationary shrub head. Figures 12 and 13 illustrate a retrofit arrangement, on an otherwise conventional embodiment of a shrub head. In the case of a retrofit arrangement, whether with an above ground pop-up sprinkler head, [or] impact head or with a shrub

head, a coupling or some other form of adaptive fitting, the retrofit arrangement is interposed between the sprinkler head itself and the riser pipe. In like manner, and specifically in the case of the pop-up sprinkler head, a substitute pop-up riser shaft [or tube] can be replaced for that existing in the conventional pop-up

VERSION WITH MARKINGS TO SHOW CHANGES

CLAIMS

Having thus described the invention, what I desire to claim and secure by letters patent is:

1 (Once Amended)

A sprinkler head assembly having off/on water flow control for turning water off and on at said sprinkler head assembly, without interrupting water flow to any adjacent sprinkler heads, said sprinkler head assembly comprising:

a) a generally upright tube which carries water from a subterranean water conduit;

b) a sprinkler head body at the upper end of the generally upright tube and said sprinkler head and generally upright tube having a duct [in] extending therethrough;

c) an insert located at said sprinkler head body for allowing a directionalized spray of water from the subterranean conduit through the sprinkler head; and

d) off/on water flow control valve means comprising a stem extending into one of said ducts for stopping water flow when the stem is in a first position and reinitiating a flow of wat r through sprinkler head

ass mbly wh n said st m is rotated to a s cond position about an axis of said stem independently of a main control therefor, thereby allowing servicing of said sprinkler head assembly without the need of controlling water flow at the main control therefor or shutting off water flow to other sprinkler head assemblies receiving water from that subterranean water conduit, said duct and said stem being arranged when in the second position to allow complete water flow and to also allow complete visual observation through said sprinkler head assembly when removed from said subterranean water conduit.

2 (Resubmitted)

The sprinkler head assembly of Claim 1 further characterized in that said off/on control valve means is located in an upstream position with respect to said insert.

3 (Once Amended)

The sprinkler head assembly of Claim 1 further characterized in that said off/on control valve means is located in one of a body of the sprinkler head, or in a sprinkler head pop-up <u>riser</u> shaft, or in an adaptiv fitting betw n th sprinkl r h ad body and the

generally upright [shaft] tube, and said control valve means is in an upstream position with respect to said insert to thereby cut-off water flow before the insert.

4 (Once Amended)

The sprinkler head assembly of Claim 1 further characterized in that said duct passes completely through said sprinkler head assembly, and said stem extends into said sprinkler head assembly and has a surface facing said duct in said assembly to block off water flow when said stem is in a first [rotatable] position into said duct and which allows water flow when said stem is rotated about its central axis so that an axis of an opening in the stem is aligned with the axis of the duct.

5 (Resubmitted)

The sprinkler head assembly of Claim 3 further characterized in that said off/on control valve means is located in a base of a shrub type stationary sprinkler head.

6 (Once Amended)

The sprinkler head assembly of Claim 3 further characterized in that said control valve means is in a pop-up riser shaft which forms part of a pop-up sprinkler head and carries said insert at its upper end thereof.

VERSION WITH MARKINGS TO SHOW CHANGES

7 (Once Amended)

The sprinkler head assembly of Claim 1 further characterized in that said stem is [angular by] angularly located with respect to an axis of said duct.

8 (Resubmitted)

The sprinkler head assembly of Claim 7 further characterized in that said duct has increased wall thickness and reduced diameter in the region of said flow control valve means.

VERSION WITH MARKINGS TO SHOW CHANGES

9 (Once Amended)

An adaptive member for use with a sprinkler head assembly and having a valve means to provide off/on water flow control at said sprinkler head assembly, said adaptive member comprising:

a) a manually actuable on/off water flow control valve located in a position with respect to a generally vertically arranged tube having a duct associated with said assembly and for allowing flow of water through said sprinkler head assembly for controlling flow of water from the [generally vertically arranged tube and the] sprinkler head assembly [from] supplied by a subterranean water sprinkler system line; and

b) a stem forming part of said valve means extending into said duct and being located with respect to a central axis of said duct for stopping water flow when in said stem is in a first position and reinitiating water flow when said stem is [rotated] shifted [about its central axis] to a second position which is angularly shifted with respect to said first position and independently of any main control for said water sprinkler system line.

VERSION WITH MARKINGS TO SHOW CHANGES

10 (Onc Amend d)

The adaptive member of Claim 9 further characterized in that said stem has an opening aligned with said duct when said stem in the [first] second position and is out of communication with said duct when the stem is in the [secured] first position.

11 (Resubmitted)

The adaptive fitting of Claim 10 further characterized in that said generally vertically arranged tube is a riser tube and said fitting is attached to said riser tube which is used in or forms part of said sprinkler head assembly.

12 (Resubmitted)

The adaptive fitting of Claim 11 further characterized in that said off/on control valve forms part of said adaptive member and is located in a region of the generally vertically arranged tube or portion of said sprinkler head assembly and which has increased wall thickness in said duct in the region of said control valve with respect to the remaining portion of the duct.

13 (Once Amended)

The adaptive fitting of Claim 10 further characterized in that said [an] opening has a diametrical size approximately the same as the duct and which opening can be rotated in so that the opening is

align d with said duct to allow water flow and stops flow when the stem is rotated so that an axis of the opening is generally perpendicularly located to a central axis of said duct.

VERSION WITH MARKINGS TO SHOW CHANGES

14 (Once Amended)

A method for turning water flow off and reinitiating water flow at a sprinkler head and which eliminates the need to control water flow from a master controller or sprinkler valve in order to enable cleaning or servicing or replacement of that sprinkler head, said method comprising:

a) installing an off/on water flow control valve means in a sprinkler head assembly connected to a subterranean water pipe;

b) manually actuating a valve stem forming part of a valve means to turn water flow off at said sprinkler head assembly by rotating an opening in said stem out of alignment with a duct of said assembly;

c) allowing for cleaning or servicing of said sprinkler head assembly [without a substantial amount of] with little or no water flowing through said assembly under pressure; and

d) rotating said plug so that the opening once again becomes aligned with the duct after cleaning or servicing to allow [2Xflow] water flow to again commence through said sprinkler head assembly.

VERSION WITH MARKINGS TO SHOW CHANGES

15 (Resubmitted)

The method of Claim 14 further characterized in that said method comprises locating said off/on control valve means in a position upstream with respect to an insert on said sprinkler head assembly.

16 (Resubmitted)

The method of Claim 13 further characterized in that said method allows for removal of said insert when water is turned off at said sprinkler head assembly, cleaning of the insert and re-introduction of the insert followed by initiating water flow again.

17 (Resubmitted)

The sprinkler head assembly of Claim 13 further characterized in that said stem is manually actuable and extends into said duct generally perpendicularly to a central axis of said duct.

18 (Once Amended)

The adaptive fitting of Claim 17 further characterized in that said stem is threaded for manually turning said stem to cause said stem to rotate to said first position in said duct and to also [rotates] rotate to said second position in said duct.

VERSION WITH MARKINGS TO SHOW CHANGES

19 (Resubmitted)

The adaptive fitting of Claim 13 further characterized in that a tool receiving area is formed at an end of said plug to cause threaded turning of said stem in said duct.

20 (Resubmitted)

The adaptive fitting of Claim 19 further characterized in that said stem has a diametrical size at least as large as that of the duct.

VERSION WITH MARKINGS TO SHOW CHANGES

ABSTRACT OF THE DISCLOSURE

A sprinkler head assembly [comprised of a base] located at the upper end of a riser tube and which [base] also carries an insert with an opening allowing for distribution of water. In accordance with the present invention, a control valve is located directly at the sprinkler head assembly. The control valve may be located in [a] the base of a stationary or shrub head which [would] could be connected to a [base or otherwise to] a riser tube. The control valve could be located in [a pop-up] the riser shaft[,] of a pop-up sprinkler head, or in a retrofit coupling or adapter located between a riser tube and sprinkler head. The control valve would rely upon a screw capable of being threadedly moved into a duct generally perpendicular thereto and which would have a diametral size somewhat larger than the duct. Moreover, the screw would be provided with an opening having a diameter approximately equal to that of the duct. The opening would be alignable with the duct in one position and when rotated 90° would completely block the flow in another position. In this way, water flow to the sprinkler head assembly may be temporarily interrupted for services or replacement of the parts thereof.